

REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Claims 4 and 6 have been withdrawn from consideration by the Examiner. Claims 4 and 6 have been amended for clarity and are believed to more clearly read on the elected species. For example, Claims 4 and 6 respectively depend from Claims 3 and 5 which recite that the driving power source comprises a diesel engine (e.g., diesel engine 12 in Figure 1A). The claims now further recite that the speed ratio at which the speed changing mechanism changes the speed of rotation of the driving power source is determined so that a maximum torque applied from the diesel engine to the CVT is substantially equal to or smaller than a maximum torque applied from a gasoline engine producing the same power as the diesel engine. Basis for this can be found in Figure 5 and paragraph [0039]. Favorable consideration of Claims 4 and 6, together with the other claims, is therefore respectfully solicited.

It has been known that a belt and pulley type continuously variable transmission (CVT) provided to change the speed of rotation output from a driving power source such as a gasoline engine or a diesel engine must be designed to conform to the torque characteristics of the driving power source with which it is mated. This generally means that a CVT designed for a gasoline engine cannot be used with a diesel engine producing the same maximum power since diesel engines generally produce power at lower rpm's and with greater torque. For example, referring to Figure 5, it can be seen that the exemplary power curve for a diesel engine peaks at a lower rpm than that of a gasoline engine. Therefore, the diesel engine will produce that power with greater torque, which requires a CVT capable of handling the higher torque output of the diesel engine.

According to a feature of the invention set forth in the claims, this problem is addressed by providing a speed changing mechanism between the driving power source and

the CVT so as to increase or reduce (i.e., alter) the speed of rotation of the driving power source during the forward running of the vehicle. For example, referring to the non-limiting embodiment of Figure 1, an auxiliary speed changing device 15 is positioned between the diesel engine 12 and the CVT 18. In this case, the speed changing device 15 is in the form of a planetary gear system which increases the rotation speed at the output shaft 35 as compared to the rotation speed at the turbine shaft 34 (paragraph [0031]). Therefore, for any given rotation speed of the diesel engine 12, the output to the forward/reverse drive switching device 16, and from there to the CVT, has a higher rotational speed than that of the diesel engine. The maximum torque is commensurately lowered and so it is possible to use the same CVT for both diesel and gasoline engines (paragraph [0007]).

In view of the above, Claim 1 recites a speed changing mechanism provided between a driving power source and a belt and pulley type CVT “so as to increase or decrease a speed of rotation of the driving power source during forward running of the vehicle.” Applicants respectfully submit that this is not taught in the cited prior art.

Claims 1 and 2 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. patent 5,156,572 to Morishige. The Examiner there alleged that Morishige teaches a driving system of a motor vehicle including “a speed changing mechanism 3 provided between the driving power source and the continuously variable transmission.” However, this rejection is respectfully traversed.

Morishige discloses a power transmission system including a CVT and a forward/reverse switching mechanism, much like that in Japanese Patent Publication 11-182666 noted on page 1 of the specification. Morishige includes an engine 1, a torque converter 2 and a CVT 4. Between the torque inverter and the CVT 4 is positioned a “forward/reverse shift unit 3” comprised of a planetary gear system combined with forwarding clutch 36 and reversing brake 37. When “the forwarding clutch 36 is fastened

and the reversing brake 37 is released, the ring gear 35 and the carrier 31 are connected [to] each other in order to rotate integrally” (see sentence bridging columns 3-4). Conversely, when the reversing brake 37 is fastened and the forwarding clutch 36 is released, the rotation provided to the CVT is reversed (column 4, lines 5-13). Thus, significantly, in the case where the forward/reverse shift unit 3 provides forward rotation to the CVT, it does so by causing the ring gear 35 and the carrier 31 to “rotate integrally” *so that there is no change in the speed ratio output from the torque converter*. That is, **the forward/reverse shift unit 3 of Morishige is not a speed changing mechanism which increases or reduces a speed of rotation of the driving power source during forward running of the vehicle.**

Accordingly, and contrary to the assertion in the Office Action, Morishige does not anticipate or render obvious the subject matter of Claims 1 and 2.

Claims 3 and 5 were rejected under 35 U.S.C. § 103 as being obvious over Morishige in view of U.S. patent 6,440,037 to Takagi. Claims 3 and 5 further recite that the driving power source is a diesel engine and the speed changing mechanism increases the speed of rotation of the diesel engine during forward running of the vehicle. The Examiner alleged that it would have been obvious in view of Takagi to have used a diesel engine in Morishige.

Figure 6 of Takagi discloses that a power transmitting mechanism for an engine 1, which may be a gasoline or diesel engine, includes both a CVT 10 and a gear speed change mechanism 9 which provides a reverse rotation combined with a change in gear ratio (column 5, lines 12-42). However, there is no explicit teaching or inherent requirement in Takagi that the gear speed change mechanism 9 thereof alters a speed of rotation of the driving power source during *forward running* of the vehicle. Thus, while the Examiner is correct that Takagi teaches that a diesel engine can be used as a driving source for a CVT system, Takagi does not provide a teaching for altering a speed of rotation of the driving power source during forward running of the vehicle and so cannot overcome the shortcomings of Morishige as

discussed above. The claims therefore define over any combination of Morishige and Takagi.

Claims 4 and 6 now unambiguously read on the elected embodiment and more clearly recite that the speed ratio set by the speed changing mechanism, when coupled to a diesel engine, is such that the maximum torque applied from the diesel engine to the CVT is substantially equal to or smaller than a maximum torque applied from a gasoline engine producing the same power as the diesel engine. As discussed above, the same CVT may therefore be used for an engine having a certain maximum power output, regardless of whether the engine is a diesel engine or a gasoline engine. There is no teaching or suggestion for this feature in the cited references.

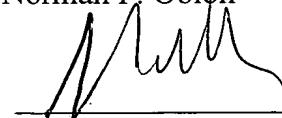
In response to the rejection under 35 U.S.C. § 112, it is noted that the speed changing mechanism provided between the power source and the CVT also increases or reduces a speed of rotation of the driving power source during forward running of the vehicle. For example, the speed changing mechanism in Figure 1 increases the speed of rotation (see paragraph [0039] of the specification). Applicants therefore respectfully submit that the claims are definite under 35 U.S.C. § 112, and request that this objection be withdrawn.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

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